



Use of traditional environmental knowledge to assess the impact of climate change on subsistence fishing in the James Bay Region of Northern Ontario, Canada

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Abstract:

INTRODUCTION: In Canada, unique food security challenges are being faced by Aboriginal people living in remote-northern communities due to the impacts of climate change on subsistence harvesting. This study used traditional environmental knowledge (TEK) to investigate whether there was a temporal relationship between extreme climatic events in the summer of 2005, and fish die-offs in the Albany River, northern Ontario, Canada. Also, TEK was utilized to examine a potential shift in subsistence fish species distribution due to climate change. **METHODS:** To investigate whether there was a temporal relationship between the fish die-offs of July 2005 (as identified by TEK) and an extreme climatic event, temperature and daily precipitation data for Moosonee weather station were utilized. To determine if there was an increasing trend in mean maximal summer temperatures with year, temperature data were examined, using regression analysis. Present-day fish distributions were determined using unpublished TEK data collated from previous studies and purposive, semi-directive interviews with elders and experienced bushman. **RESULTS:** Fish die-offs in 2005 occurred during the time period 11-18 July, as reported by participants. Recorded air-temperature maxima of the two July 2005 heat waves delineate exactly the time period of fish die-offs. Two heat waves occurring during the same summer season and so close together has never before been recorded for this region. A highly significant ($p < 0.0009$) positive relationship between mean maximal summer temperatures and year was evident. Regionally novel fish species were not apparent, utilizing TEK. **CONCLUSIONS:** Traditional environmental knowledge coupled with climate data revealed temporal relationships between extreme climatic events in 2005, and fish die-offs in the Albany River. Thus, climate change can directly impact food security by decreasing the number of fish through mortality - and indirectly through population dynamics - by impacting the yield of fish subsistence harvests in the future. By contrast, TEK did not reveal northward expansion of novel fish species in the Albany River or fish distributional contraction in the western James Bay region.

Source: [http://www.rrh.org.au/articles/showarticlenew.asp?ArticleIDEuro Surveillance \(Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin\)1878](http://www.rrh.org.au/articles/showarticlenew.asp?ArticleIDEuro%20Surveillance%20(Bulletin%20Europeen%20Sur%20Les%20Maladies%20Transmissibles%20European%20Communicable%20Disease%20Bulletin)1878)

Resource Description

Exposure : ☒

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Food/Water Security, Temperature

Climate Change and Human Health Literature Portal

Food/Water Security: Fisheries

Temperature: Extreme Heat, Fluctuations

Geographic Feature: ☒

resource focuses on specific type of geography

Ocean/Coastal, Rural

Geographic Location: ☒

resource focuses on specific location

Non-United States

Non-United States: Non-U.S. North America

Health Impact: ☒

specification of health effect or disease related to climate change exposure

General Health Impact

Resource Type: ☒

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Time Scale Unspecified